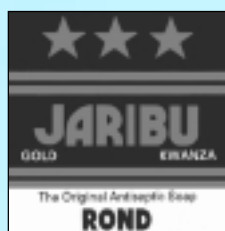




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Mercury in Soap in Tanzania

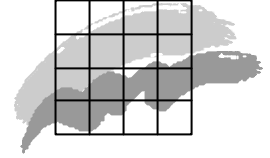
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Mercury in Soap in Tanzania

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1999



Mercury in Soap in Tanzania

***NERI Technical Report No. 306
1999***

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Data sheet

Title: Mercury in Soap in Tanzania

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Abstract: Several brands of soap and cream with high contents of mercury are sold on the markets in Tanzania. The purpose of mercury in these products is to make black skin and hair lighter coloured. The soaps and creams are manufactured in Europe, mainly in Great Britain. These soaps and creams may contain significant amounts of mercury compounds, often about one percent. Such levels pose a serious health hazard and there is a major risk of negative effects on the central nervous system and kidneys. It is suggested that the manufacturing and trade of soaps and creams containing mercury should be banned.

Keywords: Mercury, soap, cream, Tanzania, human effects

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Preface

This report is based on field work performed in Tanzania during September and October 1999, and financed by the Danish Council for Development Research (Project number: 90953) under the Danish Ministry of Foreign Affairs.

Summary

Mercury-containing soaps and creams

Several brands of soap and cream with high contents of mercury are sold on the markets in Tanzania. The purpose of mercury in these products is to make black skin and hair lighter coloured. The soaps and creams are manufactured in Europe, mainly in Great Britain. The distribution of soaps and creams containing mercury is, according to WHO, banned in many African countries, in the EEC and in North America.

Effects on central nervous system, kidneys and skin

These soaps and creams may contain about one percent of mercury, and such levels pose a serious health hazard. They may cause diseases connected with the nervous system, the kidneys and the skin in the people using the products. Mercury from the products enters the body by penetrating the skin and via inhalation. The waste water is highly contaminated with mercury and in the environment, this discarded mercury is converted into the highly toxic methylmercury by bacterial action. Methylmercury and other organic mercury compounds then enter the food chain and eventually end up in humans, for example, through fish consumption and affect human health.

It is recommended that the manufacturing and export of soaps and creams containing mercury should be banned.

A pilot project in Tanzania

In 1999 the Danish Council for Development Research (RUF) under the Danish Ministry of Foreign Affairs launched a project in Tanzania: "*An integrated approach to mineral exploration and environmental assessment in southern and eastern Africa – a pilot study in Tanzania*". This is a joint project between the Geological Survey of Denmark and Greenland, the Danish National Environmental Research Institute, the University of Dar es Salaam and the Geological Survey of Tanzania. During the field work, which took place September and October in western Tanzania (Fig. 1), the Danish participants were told about the frequent use of soaps and creams containing mercury. The Danish participants were also informed that the import of these items is strictly forbidden in Tanzania, and that the products sold on the markets in the towns and villages must have been smuggled into the country.

Resumé

Kviksølvholdige sæber og cremer i Tanzania

Kviksølvholdige sæber og cremer sælges ulovligt i Tanzania, og deres anvendelse har til formål at give sorte mennesker, især kvinder, en lysere hud og hårfarve. Sæberne fremstilles hovedsagelig i Europa af bl. a. England, og salg heraf er ifølge WHO forbudt i mange afrikanske lande, i EU og Nordamerika.

Nyre- og hjerneskader hos brugerne

Kviksølvindholdet i sæber og cremer ligger omkring én procent, og dette indhold er tilstrækkeligt til at give nyre- og hjerneskader hos brugerne. Kviksølvet kommer ind i kroppen både gennem huden og ved indånding af det letfordampelige kviksølv. Med vaskevandet føres kviksølvet ud i miljøet, hvor det af bakterier omdannes til bl. a. methylkviksølv. Dette organisk bundne kviksølv optages let af f. eks. fisk, således at kviksølvet kan vende tilbage til mennesker.

Det anbefales, at fremstilling og eksport af kviksølvholdige sæber og cremer stoppes.

Pilotprojekt i Tanzania

Deltagerne i et pilotprojekt i Tanzania, finansieret af Rådet for Ulandsforskning (RUF) under Udenrigsministeriet, blev i efteråret 1999 opmærksomme på ovenstående problemstilling. Dette pilotprojekt, "*An integrated approach to mineral exploration and environmental assessment in southern and eastern Africa – a pilot study in Tanzania*", er et fælles projekt mellem Danmarks og Grønlands Geologiske Undersøgelser (GEUS), Danmarks Miljøundersøgelser (DMU), Department of Geology, University of Dar es Salaam og Geological Survey of Tanzania.

1 Introduction

Mercury-containing products sold on markets

During a pilot project in Tanzania, financed by RUF under the Danish Ministry of Foreign Affairs, the Danish participants discovered that mercury-bearing soaps and creams manufactured in the United Kingdom were illegally smuggled into the country and sold on the markets in towns and villages. These products are claimed to be anti-septic, but the real purpose of using them is to obtain paler skin and hair.



Fig. 1 The field area in western Tanzania (red frame). Chunya is situated to the southeast and Mpanza to the northwest.

Pilot project in Tanzania

The pilot project: "An integrated approach to mineral exploration and environmental assessment in southern and eastern Africa – a pilot study in Tanzania" is a joint project between the Geological Survey of Denmark and Greenland (GEUS), the Danish National Environmental Research Institute (NERI), the Department of Geology, University of Dar es Salaam and the Geological Survey of Tanzania. The project started in early 1999 and will terminate in the spring of 2000. One part of the project consisted of field work, which was carried out by geologists from GEUS, the University of Dar es Salaam, the Geological Survey of Tanzania and a biologist from NERI (see list of participants in Appendix 1). The field work took place in the western part of Tanzania, near the towns of Chunya and Mpanda (Fig. 1).

Small-scale gold mining

In these areas, extensive mining for gold is carried out by small-scale mining (artisanal mining). This type of mining, is essentially done by hand (Fig. 2). After mining the gold ore is crushed and panned by hand, and the remaining heavy concentrate containing the gold, is treated with metallic mercury. The mercury forms an amalgam with the gold and the amalgam is subsequently heated over a small fire (Fig. 3), whereby the mercury evaporates and leaves the gold in the iron cup. The mercury which evaporates is partly inhaled by the people working on the process and partly condenses on the soil. This latter mercury is fed into the drainage system during the rainy seasons and subsequently enters the food chain.



Fig. 2 Small-scale gold mining (artisanal gold mining) in the Mpanda area

Mercury in miners and in the environment

One aim of the pilot project is to study the mercury levels in the environment, as well as in the bodies of goldminers, amalgamists and persons not directly involved in goldmining. Samples of human hair, food products, fish and soil are presently being analysed.

Mercury in women using skin-lightening products

Previous studies in northern Tanzania have shown that the mercury found in the population does not only stem from gold production. Very high concentrations were found in people who did not work with or live near places where amalgamation took place. The studies revealed that these very high mercury concentrations were most abundant in women who used soaps and creams with high concentrations of mercury. These products are used to bleach dark hair and dark skin. The soaps and creams are mainly manufactured in countries within the EEC, especially the UK. The distribution of soap and cream containing mercury is banned in many African countries, in the EEC and North America. In Tanzania, import of soap containing mercury is forbidden, but large volumes of soap with mercury, produced in the UK, are smuggled into the country.



Fig. 3 The gold-mercury amalgam is heated over the fire. The mercury evaporates and the gold is left in the iron cup.

2 Purchase and analyses of soap and cream

Purchase of soaps and creams

At the market in Mpanda in western Tanzania on 27 September, 1999 we bought three different brands of soap and two types of cream (Fig. 4a & b). The trade names and producers, as well as the country in which the products are manufactured, are listed in Table 1. All of the soaps have a declaration on the packaging stating that the soaps are antiseptic and that they contain 2% mercury iodide. This is equivalent to 0.88% mercury. The two creams claim to produce a lighter skin colour, and contain hydroquinone (both brands), allantoin and vitamin E (cream 4) and vitamin C (cream 5). No mention of mercury is made on the packaging. The different types of cream were included in this study because such creams may contain appreciable amounts of mercury.

Table 1. Soaps and creams purchased at the Tanzanian market. For their analyses of mercury, refer to Appendix 2.

Product	Trade name	Declaration	Producer	Country
Soap 1	Rico	2% Hg iodide	Rico Skin Care Ltd.	United Kingdom
Soap 2	Jaribu	2% Hg iodide	Anglo Fabrics (Bolton) Ltd.	United Kingdom
Soap 3	Jambo	2% Hg iodide	Jambo	United Kingdom
Cream 4	Movate	Hydroquinone	Pramil srl Melzo (Milano)	Italy
Cream 5	Dear Heart	Hydroquinone	Cosmetic Expression Ltd.	United Kingdom

Products analyse for mercury

All products were analysed for mercury at NERI, Dept. of Arctic Environment. The three brands of soap contained, on average, 0.69% mercury, which is about 78% of the content declared on the packaging. The two creams did not contain detectable mercury, which was in agreement with the specifications on the packagings. Analytical methods and results are presented in Appendix 2.

3 Mercury in soaps and creams

The use of soaps and creams containing mercury

The following account is based mainly on the book *Inorganic Mercury* (WHO 1991). Mercury-bearing soap and cream has been used extensively by dark-skinned people in order to bleach their skin and hair, and probably works due to inhibition of pigment formation. The distribution of these products is forbidden in the EEC, North America and many African countries. In Tanzania, import of these products is forbidden (Kahatano *et al.*, 1998, S. R. Mnali, *pers. comm.* 1999).



Fig. 4a The purchased mercury containing soaps: Jaribu, Jambo and Rico, bought at the market in Mpanda, and the two non-containing creams.

The products contain 1-10% mercury-compounds

In spite of these restrictions, soap and cream containing mercury is manufactured in European countries, mainly the UK, and sold as antiseptic soap to Third World countries. These products are also sold in areas of Europe that have a substantial black population, such as London and Brussels. This indicates that the UK-produced soap containing mercury is exported to Third World countries, and then re-imported to the UK and Belgium. WHO (1991) reports that these soaps contain in the order of 1 to 3% mercury iodide. Creams meant for bleaching the skin often contain 1 to 10% mercury ammonium. The soap and cream is meant to be applied to the skin, then left to dry and left on overnight.



Fig. 4b Declarations of the two soaps: Jambo and Jaribu, containing two percent mercury iodide.

4 Mercury in users of soaps and creams

Mercury in urine and kidney diseases

Mercury from soap and cream enter the body through the skin and via inhalation. The following studies are derived from WHO (1991). A group of 60 women from Kenya, who had used cream containing 5 to 10% ammoniated mercury, had an average of 0.1 mg mercury per litre of urine, and 26 of these women had an average of 0.15 mg mercury per litre of urine. The latter group had developed the nephrotic syndrome (renal diseases). Another study showed that a group of 6 women, who had used cream with 1 to 3 % ammoniated mercury had 0.03 to 0.6 mg mercury per litre of urine.

Mercury in non-miners

A study carried out in Tanzania amongst gold miners and people not employed in gold mining or amalgamation showed that some women, who were not active in gold mining or amalgamation, had up to 0.1 mg mercury per litre of urine, and it was concluded that the mercury was derived from soap and cream containing mercury (Kahatano *et al.*, 1998).

Mercury in hair

The mercury levels in human bodies can be measured by analysing samples of hair. Kahatano *et al.* (1998) found that 5 out of 9 women had an average of 244 mg mercury per kg hair (range 20 to 490 mg per kg), whereas the remaining 21 persons in the study had on average 2.3 mg mercury per kg hair. The very high mercury contents were ascribed to usage of soap and cream containing mercury.

Mercury in hair from different human groups

The mercury content of hair from people from various areas are shown in Appendix 3. It is obvious from the figures shown in Appendix 3, that women using soap and cream containing mercury have the highest levels of mercury in their hair.

5 Effects of inorganic mercury on humans

Health effects of inorganic mercury

The most frequently observed effects of inorganic mercury on humans are connected with the central nervous system, the kidneys and the skin, cf. the following summary based on WHO (1991).

The central nervous system

The initial effects on the central nervous system are erethism, excessive shyness and insomnia. With continued exposure, a fine tremor develops, initially involving the hands and later spreading to the eyelids, lips and tongue, causing violent muscular spasms in the most severe cases. Different studies have shown that effects on the central nervous system occur when the mercury concentration in the urine is between 0.02 and 0.5 mg per litre. Neurological signs and symptoms have been observed at mercury concentrations in the urine in excess of 0.5 mg per litre, while impaired performance in mechanical and visual memory tasks has been associated with urine mercury concentrations in excess of 0.1 mg per litre. A decrease in verbal intelligence and memory was seen more frequently in people with a urine mercury concentration above 0.06 mg per litre, and people with mercury concentrations in the urine of about 0.02 mg per litre had a significantly slower and more attenuated electroencephalogram (EEG) than controls. A significant increase in forearm tremor was observed at urine mercury concentrations above 0.05 mg per litre.

The kidneys

Recent studies show that effects on the kidneys become apparent at lower levels than effects on the central nervous system. Effects of inorganic mercury on the kidneys include, amongst others, proteinuria and nephrotic syndrome. The latter has occurred, for example, after the use of skin-lightening creams containing inorganic mercury. The concentration of a specific urinary enzyme related to nephrotic syndrome increases as urine mercury concentrations increases over the range of 0.1 to 0.25 mg per litre. Two different studies found that increased urinary excretion of protein and increased levels of a certain enzyme in plasma were at urine mercury concentrations of about 0.04 mg per litre.

The skin

Effects of mercury poisoning on the skin have not been reported in relation to the use of mercury-containing soap and cream, but to amalgam fillings, teething powder and ointments for children below five years of age. The symptoms include: dermatitis, red and swollen extremities and desquamated skin. The urinary excretion of mercury in the affected children was elevated, but below the recommended level.

6 Environmental impacts

Inorganic to organic mercury in the environment

Mercury from the soap and cream is transferred to the drainage system and thence into the environment. Here it enters the organisms either as inorganic mercury compounds, or is converted by bacterial action to organic mercury, e. g., methylmercury. Methylmercury is readily incorporated into the food chain and concentrated in fish and fish-eating birds. When fish are eaten by humans, the results can be fatal, for example, in Minamata in Japan. Elimination of methylmercury from fish and other aquatic organisms is slow.

Mercury effects on organisms

Mercury compounds are highly toxic to microorganisms even in concentrations as low as 0.005 mg inorganic mercury per litre. Organic mercury compounds are ten times more toxic to microorganisms. In aquatic environments, the organic compounds are generally more toxic than inorganic compounds. Aquatic plants are affected by concentrations as low as 1 mg inorganic mercury per litre, whereas organic compounds are toxic at much lower concentrations. Larvae of insects are generally more sensitive to mercury compounds than adults. Lethal concentrations (LC50-values) of inorganic mercury compounds to freshwater fish are in the range of 0.03 to 0.4 mg per litre, whereas sea-water fish seem to be more resistant. Low concentrations of mercury compounds have an impact on fish by reducing their reproduction. Terrestrial plants are generally unaffected by high mercury concentrations, whereas birds contaminated by mercury show a reduction in food intake, and consequent poor growth. These observations have been described in WHO (1989) quoted in WHO (1991).

Mercury in pregnant women and their babies

Pregnant women who have eaten fish containing methylmercury transfer this mercury very efficiently to their foetuses. As a consequence their new-born babies have a much higher mercury contents in their blood than their mothers (Hansen *et al.*, 1984). It has been demonstrated that even quite low mercury levels in mothers during pregnancy affect the ability of their children to solve mental problems, when these are presented to the seven year old children (Grandjean *et al.*, 1999).

7 Conclusion and recommendations

Effects on women using mercury-containing products

Several studies have shown that women using soap and cream containing mercury attain mercury concentrations in their urine from 0.03 to 0.15 mg per litre. At these concentrations, there is a major risk of negative effects on their central nervous system and kidneys, since such effects have been demonstrated at concentrations from 0.02 to 0.5 mg per litre. In one study, women with an average urine mercury concentration of 0.15 mg per litre had developed kidney diseases. In a study of mercury in hair, five women had average mercury contents exceeding the threshold for an acute risk of poisoning, which is 50 mg mercury per kg hair (Appendix 3). The high mercury contents in their hair were ascribed to their use of soaps and creams with mercury.

Methylmercury in human food

The remainder of the mercury in the soap and cream goes with the waste water into the environment where it enters the food chain and returns in methylated form via fish to humans. Methylmercury therefore is efficiently transferred to unborn babies, and affects their mental abilities.

The manufacture of mercury-containing soaps and creams

There are, therefore, many reasons for banning mercury-containing soaps and creams, which are manufactured and sold under the presumption of being antiseptic, although the real purpose is to bleach human hair and skin. In spite of this ban, these products can be bought in Tanzania, other African countries and some countries in Europe. In Tanzania, import of these products is forbidden. However, it is very difficult to prevent illegal import, and large amounts of soaps and creams are apparently smuggled into Tanzania. The most efficient way to restrict the use of these soaps and creams is to control their manufacture most of which are located in Europe, and especially in the UK. In EEC the use of mercury in cosmetics is legal only in eye makeup cleansing products containing max. 0.07 % phenylmercurysalts, whereas the manufacture of mercury-containing soaps and creams is not illegal. Inorganic mercury compounds are listed in the PIC (Prior Informed Consent) Convention (UNEP/FAO) for certain hazardous chemicals in international trade, but refers to pesticide use only (Danish Environmental Protection Agency, pers. comm.). Despite the fact that the manufacture of mercury-containing products is not illegal in EEC, we find it immoral that companies within the EEC exploit Third World countries by producing and exporting these products, which pose serious health hazards to mankind and are very toxic to the environment.

A suggestion

We therefore find that the Danish Minister of Energy and Environment should suggest that the EEC ban any further production and trade of soaps and creams containing mercury compounds.

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9 Appendix 1, Participants in the field trip

Professor Dr. S. M. Muhongo (Dept. of Geology, University of Dar es Salaam)

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M. Sc. E. B. Temu (Geological Survey of Tanzania)

Senior scientist P. W. U. Appel (Geological Survey of Denmark and Greenland)

Senior scientist H. Stendal (Geological Survey of Denmark and Greenland)

Senior scientist C. M. Glahder (Danish National Environmental Research Institute)

10 Appendix 2, Analyses of soaps and creams from Tanzania

The laboratory at the Dept. of Arctic Environment, Danish National Environmental Research Institute (AE, NERI) has analysed three tablets of soap and two tubes of creams bought in Tanzania by Christian Glahder (AE, NERI). Replicate samples were analysed for total mercury after high pressure opening with nitric acid at 140 °C for 12 hours. The method is cold flameless atomic absorption after reduction with sodium borohydride. The referencematerial DOLT-2, with a certified mercury content of 2.13 mg/kg, was analysed as a control.

Results (mercury in mg/kg):

Soap 1:	RICO the powerful germicidal soap	6900	7200
Soap 2:	JARIBU Gold Kwanza: The Original Antiseptic Soap	6200	6400
Soap 3:	JAMBO 1st choice ***:	7000	7400
Cream 4:	MOVATE Super Clear Complexion Cream:	< 7	< 7
Cream 5:	DEAR HEART Complete skin lightening treatment for bright successful people:	< 7	< 7

Dolt-2	AE concentration:	2.24
Dolt 2	certified concentration:	2.13

Dolt-2 = Dogfish liver, reference material

On the packaging, it is indicated that the soaps contain 2% mercury iodide. This is equivalent to a content of 8800 mg/kg of mercury which is slightly higher than found from our analyses.

It is stated that the creams contain hydroquinone. A mercury content is not mentioned on the packaging. This is in agreement with our analyses.

Senior scientist Gert Asmund
Head of the Laboratory, Chemical Engineer
NERI, AE

11 Appendix 3, Total mercury in human hair.

Data derived from the literature

<i>Place</i>	<i>Human group/No.</i>	<i>Hg, mg/kg</i>	<i>References</i>
Denmark	whole population	0.61	Bach (1980)
Aarhus (DK)	7 persons	2.0	Hansen (1981)
Upernavik (G)	14 persons	12.4	Hansen (1981)
Uummannaq (G)	22 persons	12.8	Hansen (1981)
Nuuk (G)	50 persons	8.0	Hansen (1981)
Julianeháb (G)	25 persons	7.2	Hansen (1981)
Scoresbysund(G)	6 or more seal meals/week	15.5	Hansen (1981)
Scoresbysund(G)	3-6 seal meals/week	9.7	Hansen (1981)
Scoresbysund(G)	3 or less seal meals/week	10.4	Hansen (1981)
Amazonas	Rio Urubaxi Acariquara 15 persons	69.2	Silva-Forsberg <i>et al.</i> (1999)
Amazonas	Rio Marie 57 persons	97.44	Silva-Forsberg <i>et al.</i> (1999)
Amazonas	Rio Uneixi 17 persons	76.75	Silva-Forsberg <i>et al.</i> (1999)
Amazonas	Rio Negro 23 persons	69.58	Silva-Forsberg <i>et al.</i> (1999)
Amazonas	Rio Padauari 11 persons	37.48	Silva-Forsberg <i>et al.</i> (1999)
Amazonas	Total 154 persons	75.46	Silva-Forsberg <i>et al.</i> (1999)
Bolivia	Asuncion, Amazonas, <i>m</i> rarely eat. fish	3.7	Maurice-Bourgoin <i>et al.</i> (1999)
Bolivia	Asuncion, Amazonas <i>f</i> rarely eating fish	5.5	Maurice- Bourgoin <i>et al.</i> (1999)
Bolivia	Rurrenabaque <i>f</i> often fish eating	14.48	Maurice- Bourgoin <i>et al.</i> (1999)
Bolivia	Rurrenabaque teen-agers often eat. fish	17.93	Maurice- Bourgoin <i>et al.</i> (1999)
Bolivia	Carmen Florida <i>m</i> rarely eating fish	6.87	Maurice- Bourgoin <i>et al.</i> (1999)
Bolivia	Carmen Florida <i>f</i> rarely eating fish	6.87	Maurice- Bourgoin <i>et al.</i> (1999)
Threshold	Poisoning risk (children, pregnant)	10	WHO (1976)
Threshold	Acute poisoning risk	50	WHO (1976)
Lake Victoria	Mwanza town 6 <i>m</i> non-miners	1.1	Kahatano <i>et al.</i> (1998)
Lake Victoria	Mwanza town 6 <i>f</i> non-miners	122	Kahatano <i>et al.</i> (1998)
Lake Victoria	Authors of ref. 6	3	Kahatano <i>et al.</i> (1998)
Lake Victoria	Mwakitolyo mine-workers 8 <i>m</i>	3.3	Kahatano <i>et al.</i> (1998)
West Tanzania	Chunya/Mpanda amalgamists 9 <i>m</i>	2.9	Glahder & Asmund (1999)

m = men, *f* = women, G = Greenland

Approximate ranking of selected human groups according to their magnitude of mercury content in their hair

Women using mercury soaps	122 mg Hg/kg
Fish consumers in Brazilian Amazon tributaries with gold exploitation	75
Fish consumers in Bolivia	16
Seal consumers in Scoresbysund, Greenland	15
Greenland Inuits	10
Non-fish consumers in the Amazon	6
Miners in Tanzania	3
Citizens of Aarhus, Denmark (average, 7 persons)	2
Non-miners at Lake Victoria, Tanzania	1.1
Danes (average)	0.6

National Environmental Research Institute

The National Environmental Research Institute, NERI, is a research institute of the Ministry of Environment and Energy. In Danish, NERI is called *Danmarks Miljøundersøgelser (DMU)*.

NERI's tasks are primarily to conduct research, collect data, and give advice on problems related to the environment and nature.

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Publications:

NERI publishes professional reports, technical instructions, and the annual report. A R&D projects' catalogue is available in an electronic version on the World Wide Web.

Included in the annual report is a list of the publications from the current year.

Faglige rapporter fra DMU/NERI Technical Reports

- Nr. 278: Luftforurening ved en planlagt udvidelse af Billund Lufthavn. Undersøgelse udført af Danmarks Miljøundersøgelser for Billund Lufthavn. Af Berkowicz, R., Fenger, J. & Winther, M. 88 s., 100,00 kr.
- Nr. 279: Pesticider i drikkevand 2. Præstationsprøvning. Af Nyeland, B.A. 261 s., 80,00 kr.
- Nr. 280: Vurdering af effekten af en vindmøllepark ved Overgaard på forekomsten af fugle i EF-fuglebeskyttelsesområde nr. 15. Af Clausen, P. & Larsen, J.K. 31 s., 40,00 kr.
- Nr. 281: Control of Pesticides 1998. Chemical Substances and Chemical Preparations. By Krongaard, T. & Petersen, K.K. 23 pp., 50,00 kr.
- Nr. 282: Vingeindsamling fra jagtsæsonen 1998/99 i Danmark. Wing Survey from te 1998/99 Hunting Season in Denmark. Af Clausager, I. 47 s., 40,00 kr.
- Nr. 283: Krager, husskader og småvildt. En vurdering af prædationens effekt på småvildtbestande og muligheden for at begrænse effekten ved jagt og regulering. Af Asferg, T. 49 s., 60,00 kr.
- Nr. 284: Anskydning af vildt. Status for undersøgelser 1999. Af Noer, H., Hartmann, P., Christensen, T.K., Kanstrup, N. & Hansen, E.B. 61 s., 80,00 kr.
- Nr. 285: Naturkvalitet - kriterier og metodeudvikling. Af Nygaard, B., Mark, S., Baattrup-Pedersen, A., Dahl, K., Ejrnæs, R., Fredshavn, J., Hansen, J., Lawesson, J., Münier, B., Møller, P.F., Risager, M., Rune, F., Skriver, J., Søndergaard, M. 116 s., 130,00 kr.
- Nr. 286: Chlorerede, phosphorholdige og andre pesticider i drikkevand. Metodeafprøvning. Af Nyeland, B. & Kvamm, B.L. 323 s., 150,00 kr.
- Nr. 287: The Danish CORINAIR Inventories. Time Series 1975-1996 of Emissions to the Atmosphere. By Winther, M., Illerup, J.B., Fenhann, J. & Kilde, N. 81 pp., 100,00 DDK.
- Nr. 288: Mere og bedre natur i landbrugslandet - dokumenteret grundlag for en ekstra indsats. Reddersen, J., Tybirk, K., Halberg, N. & Jensen, J. 109 s., 120,00 kr.
- Nr. 289: Atmosfærisk deposition af kvælstof 1998. NOVA 2003. Af Skov, H., Hertel, O., Ellermann, T., Skjødt, C.A. & Heidam, N.Z. 102 s., 110,00 kr.
- Nr. 290: Marine områder - Status over miljøtilstanden i 1998. NOVA 2003. Af Markager, S. et al. 161 s., 150,00 kr.
- Nr. 291: Søer 1998. NOVA 2003. Af Jensen, J.P., Søndergaard, M., Jeppesen, E., Lauridsen, T.L. & Sortkjær, L. 106 s., 125,00 kr.
- Nr. 292: Vandløb og kilder 1998. NOVA 2003. Af Bøgestrand, J. (red.) 130 s., 150,00 kr.
- Nr. 293: Landovervågningsoplände 1998. NOVA 2003. Af Grant, R. et al. 152 s., 150,00 kr.
- Nr. 294: Bilparkmodel. Beregning af udvikling og emissioner. ALTRANS. Af Kveiborg, O. (i trykken).
- Nr. 295: Kvalitetsparametre for haglammunition. En undersøgelse af spredning og indtrængningsevne som funktion af haglenes størrelse og form. Af Hartmann, P., Kanstrup, N., Asferg, T. & Fredshavn, J. 34 s., 40,00 kr.
- Nr. 296: The Danish Air Quality Monitoring Programme. Annual Report for 1998. By Kemp, K. & Palmgren, F. (in press).
- Nr. 297: Preservatives in Skin Creams. Analytical Chemical Control of Chemical Substances and Chemical Preparations. By Rastogi, S.C., Jensen, G.H., Petersen, M.R. & Worsøe, I.M. 70 pp., 50,00 DDK.
- Nr. 298: Methyl t-Butylether (MTBE) i drikkevand. Metodeafprøvning. Af Nyeland, B., Kvamm, B.L. (i trykken).
- Nr. 299: Blykontaminering af grønlandske fugle - en undersøgelse af polarlomvie til belysning af human eksponering med bly som følge af anvendelse af blyhagl. Af Johansen, P., Asmund, G. & Riget, F.F. (i trykken).
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- Nr. 301: Emissionsfaktorer for tungmetaller 1990-1996. Af Illerup, J.B., Geertinger, A., Hoffmann, L. & Christiansen, K. (i trykken)
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- Nr. 303: Ecological Risk Assessment of Genetically Modified Higher Plants (GMHP). Identification of Data Needs. By Kjær, C., Damgaard, C., Kjellsson, G., Strandberg, B. & Strandberg, M. (in press).
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- Nr. 305: Interkalibrering omkring bestemmelse af imposex- og intersexstadier i marine snegle. Resultat af workshop afholdt den 30.-31. marts 1999 af Det Marine Fagdatacenter. Af Strand, J. & Dahl, K. (i trykken).
- Nr 306: Mercury in Soap in Tanzania. By Glahder, C.M., Appel, P.W.U. & Asmund, G. (in press).

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- Nr. 307: Cadmium Toxicity to Ringed Seals (*Phoca hispida*). An Epidemiological Study of possible Cadmium Induced Nephropathy and Osteodystrophy in Ringed Seals from Qaanaaq in Northwest Greenland. By Sonne-Hansen, C., Dietz, R., Leifsson, P.S., Hyldstrup, L. & Riget, F.F. (in press)

Several brands of soap and cream with high contents of mercury are sold on the markets in Tanzania. The purpose of mercury in these products is to make black skin and hair lighter coloured. The soaps and creams are manufactured in Europe, mainly in Great Britain. These soaps and creams may contain significant amounts of mercury compounds, often about one percent. Such levels pose a serious health hazard and there is a major risk of negative effects on the central nervous system and kidneys. It is suggested that the manufacturing and trade of soaps and creams containing mercury should be banned.

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